The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended)   A carrier reproducing method of a PSK modulated signal, comprising steps of:

synchronously detecting the PSK modulated signals with a reproducing carrier signal from an oscillator to create a synchronous detecting signal;

phase-detecting said synchronous detecting signal to create a phase detecting signal;

creating an auto-correlation function output taken over a predetermined time interval (TMCC period) on said phase detecting signal; and

applying a control signal based on a period of said auto-correlation function output to said oscillator to make a reproducing control signal from said oscillator synchronize with a carrier of the PSK modulated signal,

characterized in that a phase rotation of a predetermined angular velocity (α) which is larger than a maximum expected alienation frequency of said oscillator with respect to [[the]] a carrier frequency to said phase detecting signal so that on the phase detecting signal to which said phase rotation is given, the auto-correlation function output taken over said predetermined period is created.

2. (Original) The carrier reproducing method according to claim 1, characterized in that said synchronous detecting signal is a signal point arrangement conversion signal obtained by multiply-detecting said reproducing carrier signal and the PSK modulated signal to create I, Q signals and implementing a signal point arrangement conversion for said I, Q signals, and the phase rotation of a predetermined angular

velocity (α) to said phase detecting signal is a phase-rotation of the predetermined angular velocity (α) taken for said signal point arrangement conversion signal.

3.   (Original)   The carrier reproducing method according to claim 1 or 2, characterized in that said control signal having a polarity is created from a value derived by subtracting said predetermined angular velocity (α) from an angular velocity ($\omega + \alpha$) corresponding with a period of said auto-correlation function.

4.   (Currently Amended)   The carrier reproducing method according to claim 1, characterized in that a period (T) corresponding with a difference between said predetermined angular velocity (α) and a maximum one of said expected alienation frequency is selected so as to become smaller than a predetermined time interval taking said ~~correlation~~ auto-correlation.

5.   (Previously Presented)   The carrier reproducing method according to any one of claims 1, 2 or 4, characterized in that said predetermined angular velocity (α) is an α having positive polarity or negative polarity.

6.   (Original)   The carrier reproducing method according to claim 2, characterized in that said I, Q signals are inputted and a predetermined time interval width taking said auto-correlation is determined from said I, Q signals.

7.   (Currently Amended)   A synchronous detecting apparatus of a PSK modulated signal, comprising:

an oscillator (NCO) for outputting a reproducing carrier signal;

[[a]] synchronous detection circuits (1, 3) for synchronously-detecting a reception PSK modulated signal with said reproducing carrier signal to create I, Q signals;

a signal point arrangement converting circuit (5) for implementing a signal point arrangement conversion on said I, Q signals to create a signal point arrangement conversion signal;

a phase detecting circuit (6) for phase-detecting said signal point arrangement conversion signal to create a phase detecting signal; and

an auto-correlation detection circuit (7) for taking an auto-correlation over a predetermined time interval on said phase detecting signals to produce an auto-correlation function output and for giving to said oscillator a signal based on the auto-correlation function output to control an oscillation frequency of said oscillator,

characterized by a phase rotation circuit (8) for causing said signal point arrangement signal to phase-rotate by a predetermined angular velocity (α) which is larger than a maximum expected alienation frequency of said oscillator with respect to a carrier frequency.

8. (Original) The synchronous detecting apparatus according to claim 7, further comprising a subtracting circuit (9) for subtracting a value corresponding with said predetermined angular velocity from a signal based on said auto-correlation function output.

9. (Canceled)

10. (Currently Amended) The synchronous ~~detesting~~ detecting apparatus according to claim 7 or 8, further comprising a circuit (4) for determining a value of the predetermined time interval taking said auto-correlation, according to said I, Q signals.